Principles of Materiel Packaging

“Supporting The Victory”

Terminal Learning Objective

Action:

This block of instruction emphasizes the importance of packing of military supplies and equipment.

Condition:

It contains detailed information concerning the requirements to accomplish packing operations. The requirements include use of exterior shipping containers; the assembling of items or packs into container; anchoring, blocking, bracing, and cushioning of items or packages within the container; weatherproofing; strapping of containers.

Standard:

Accomplish the packaging of materiel in accordance with TM 38-701 and exterior marking in accordance

Objectives of Military Packing

- **Achieving uniform packing of item of military supply**
- **Insure optimum life, utility and performance of materiel through prevention of deterioration or damage**
- **Support the materiel readiness posture of DOD**
- **Provide for efficient receipt, storage, inventory, transfer and issue of materiel**

Military Packing Levels of Protection

- Levels of protection are a means of specifying the level of

  military preservation and packing

- Military Level of Preservation: Preservation designed to protect an item during shipment, handling, indeterminate storage, and distribution to consignees worldwide

- Military Levels of Packing:
  - Level A
  - Level B
  - Commercial Packing

Military Levels of Packing

- **Level A is the protection required to meet the most severe worldwide shipment, handling, and storage conditions):**
- **Level A pack must include applied preservation**
- **Be capable of protecting material from effects of direct exposure to extremes of climate, terrain, operational and transportation environments**
- **Level A packing requirements include, but are not limited to, overseas type wood boxes and plastics and metal reusable containers**

Military Levels of Packing

- **Level B is the protection required to meet moderate worldwide shipment, handling, and storage conditions):**
- **Level B pack must include applied preservation**
- **Be capable of protecting material from effects of not directly exposed to extremes of climate, terrain, operational transportation environments**
- **Level B packing requirements include, but are not limited to, domestic wood crates, weather-resistant fiberboard containers, fast pack containers, weather-resistant fiber drums, and weather-resistant paper and multi-wall shipping sacks**

Military Levels of Packing

- **Commercial Packing is the materials and methods used by the supplier to meet requirements serving the DOD and commercial consumer distribution systems**

- **Commercial packaging will be acceptable for any level of protection when**
  - ✓ **technical design of the package meets all conditions of the level of protection specified**
  - ✓ **it will be marked to the level it meets**

Blocking and Bracing

- **Blocking and bracing use to prevent movement**
- **Application of blocking and bracing materials:**
  - **folded pads**
  - **flat pads**
  - **corner pads**
  - **corrugated fiberboard liners**
  - **corner posts**
  - **wood or plywood**

Strapping Reinforcement

- Metal Strapping
- Web Strapping
- Pressure Tape

Strapping of Fiberboard Boxes

Girthwise Straps

Length of box determines the number

- **Less than 20” = 1 strap**
- **Between 20” - 30” = 2 straps**
- **Over 30”- 48”= 3 straps**

Lengthwise Straps

Width of box determines the number

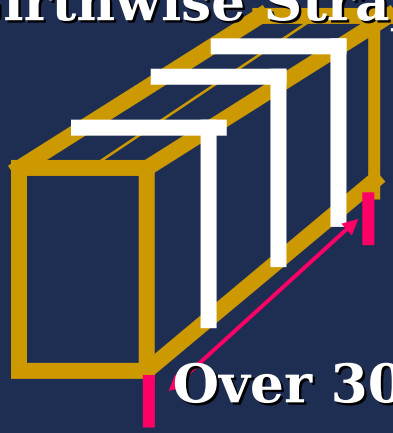
- **Less than 9” = no straps**
- **Over 9” - 18” = 1 straps**
- **Over 18” - 30” = 2 straps**

Girthwise and Lengthwise Charts

Length of box determines the number of Girthwise Straps

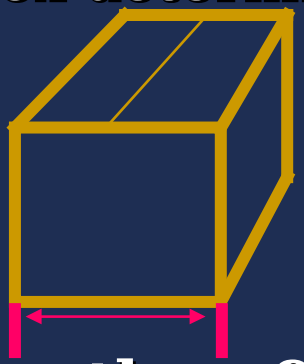
Less than 20

20 to 30



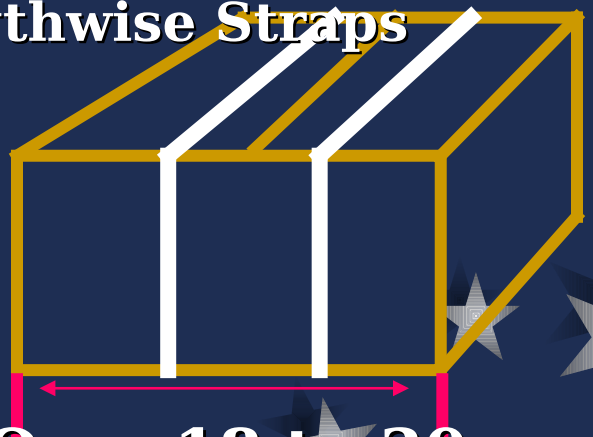
Over 30 to 48

th of box determines the number of lengthwise Straps



Less than 9

Over 9 to 18



Over 18 to 30

Types of Shipping Containers

- **Postal regulations require containers strong enough to retain and protect their contents from the weight of other mail**
- **Common containers used depending on size, weight, and nature of the article(s):**
  - ✔ **Fiberboard boxes**
  - ✔ **Folding Boxes**
  - ✔ **Cans, Fiber, Spirally-wound**
  - ✔ **Sacks, Shipping, Paper, Cushion**
  - ✔ **Burlap Cotton and Waterproof Laminated Textile Shipping Bags**

Advantages of Cargo Unitization Loads

- Eliminates laborious and expensive manual handling of individual item
- Reduces damage to items by eliminating manual handling
- Permits savings in handling costs
- Reduces personnel accidents by eliminating manual lifting
- Simplifies inventorying and reduces inaccuracies
- Utilizes storage heights not possible by manual means
- Reduce pilferage because of unitization of items by steel straps
- Permits faster movement of supplies and equipment

Palletizing Unit Loads Limitations

- MILVAN
  - **shall not exceed 40 inches in length**
  - **shall not exceed 48 inches in width**
  - **shall not exceed 41 inches in height**
- SEAVAN
  - **shall not exceed 40 inches in length**
  - **shall not exceed 48 inches in width**
  - **shall not exceed 43 inches in height**
- Other pallet loads
  - **shall not exceed 43 inches in length**
  - **shall not exceed 52 inches in width**
  - **shall not exceed 54 inches in height**

Shrink Film Palletization

- **Plastic films such as polyethylene are now being used in accordance with the requirements of MIL-HDBK-774 as a means of bonding palletized loads**

- **Stretched film shrinks when subjected to a controlled flow of heat air**
  - **the heated air supplied by use of a heat cannon or a shrink film chamber**

Stretch Film Palletization

- Can be used as a means of bonding palletized loads for many commodities shipped in the Continental United States (CONUS) or when shipped containerized
- Stretched film materials:
  - polyethylene (PE)
  - polvvinylchloride (PVC)
  - ethyl vinyl acetate (EVA)
- The film is wrapped around the load in multiple layers
  - from top of the bottom deck board
  - to not less than two inches above the height of the load
- Required thickness determined by the kind of film being used and the weight of the load

Packaging and Handling of Electrostatic Discharge Sensitive (ESDS) Items

- **Electrostatic Discharge Sensitive (ESDS) Items are parts assemblies that are sensitive to damage.**

- **Electrostatic Discharge (ESD) is a transfer of electrostatic charge between bodies at a different electrostatic potentials caused by direct contact or induced by an electrostatic field.**

Sources of ESD Damage

People are the prime source of ESD damage to electronic items. Charges generated by rubbing or by separating materials are transmitted to a person's conductive sweat layer causing that person to be charged.

Typical Electrostatic Voltages

Electronic Voltages

Means of Static Generation	10-20 % Humidity	60-90 % Humidity
• Walking across a carpet	35,000	1,500
• Walking over vinyl floor	12,000	250
• Worker at bench	6,000	100
• Vinyl Envelopes	7,000	600
• Common Poly Bag	20,000	1,200

Types of ESD Failure

There are two main types of ESD failure. They are Catastrophic and Upset:

- **Catastrophic Failure (Permanent) is a sudden and complete failure of an ESDS item resulting from static electricity such as a discharge from a person to an object or an electrostatic field.**
- **Upset Failure (Temporary) is described as a failure such as temporary loss of the equipment's functions when the equipment is operating**

General Control Measures

- **ESD Protective Materiel**
- **Humidity Control**
- **Static Controlled Workstation**
- **Clear and precise ESD Markings**
- **Training on Common ESD causes and Effects**

Summary

- **Objectives of Military Packing**
- **Military Packing Levels of Protection**
- **Functions and Selection of Shipping Containers**
- **Consolidation and Unitization for Shipment and use of Cargo Containers**
- **Packaging and handling of ESDS items**